

The Air Quality Impact of Land Use
Policies and Standards in the
Central Naugatuck Valley Region

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ABSTRACT: This report evaluates the air quality impact of a variety of land use policies and Standards contained in local zoning regulations. In particular, the report focuses upon air quality problems generated by the mixing of incompatible land uses, the segregation of compatible land uses and the adoption of energy inefficient land development standards for new industry. The report identifies specific land use policies or standards in each municipality that may be of concern to air quality planners.

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Introduction

This report explores the extent to which local land use regulations and policies and zoning standards for industrial development adversely affect air quality in the Central Naugatuck Valley Region. While zoning regulations are designed to eliminate potential threats to the public health, safety and general welfare, there are instances where regulations inadvertently create or sustain serious air quality problems. Air quality problems may be created if a zoning commission allows certain industries to locate in its community without considering the types of pollutants it generates or the most appropriate location for siting these firms. The first part of this report identifies land use policies which may strongly influence the long term protection of air quality within the Region. In particular, it addresses: (1) permitted land uses which are of possible air quality concern, (2) the air quality impacts of incompatible land development patterns, (3) the air quality impacts of segregated land development patterns, (4) the degree to which land use regulations can control energy resources utilized by industrial land uses, (5) the significance of meteorology as a factor affecting industrial siting decisions, (6) current procedures for controlling or prohibiting known generators of toxic or hazardous air pollutants, and (7) the value of performance standards for smoke, dust, fly ash, gas fumes and odors as tools for protecting air quality at the community level.

The second part of this Report specifically identifies industrial development standards contained within local zoning regulations that may have an indirect impact upon air quality. In particular, air quality may be affected by industrial development standards for: (1) parking space requirements,

(2) building height limitations, (3) regulations for maximum floor area ratios, and (4) minimum floor area requirements for industrial plants.

These four types of standards have been evaluated since they may constrain or encourage the size, configuration and height of buildings which in turn may influence the energy requirements of industrial buildings built within the community. In addition, parking space requirements may affect the energy consumed by employees for the journey to work trip if public transportation or carpooling options are less appealing due to the overabundance of parking spaces at the industrial plant.

A. Air Quality Impact of Land Use Regulations and Policies

1. Permitted uses of possible Air Quality concern

An examination of the zoning regulations of the 12 municipalities which have adopted zoning reveals that numerous industrial and commercial land uses of questionable air quality benefit are permitted within the Central Naugatuck Valley Region. To some extent the presence of permissive regulations reflects past patterns of development in a Region which has historically been more heavily industrialized than most other areas of Connecticut or the United States. The permissiveness of industrial zoning regulations is particularly clear in the City of Waterbury where 8 different types of industrial and commercial land uses are permitted, all of which are of possible air quality concern. (See Table 3.) Prospect allows 6, Thomaston allows 4 and Cheshire, Middlebury, Oxford and Southbury each allow 3 different types of commercial or industrial land uses which may be of possible air quality concern including iron and steel foundries, nonferrous foundries, heat finishing plants, metal finishing plants, heat treating plants, manufacturers of rubber and miscellaneous products, coal yards, dry cleaning plants, dyeing plants, and firms engaged in the removal and processing of earth products. The magnitude of the air quality impact of any of these different commercial or industrial uses will of course depend upon the size of the firm and the types of air pollutants emitted. The important factor to be considered here is the fact that local economic development efforts, as reflected in local zoning ordinances, have been excessively permissive concerning the types of industries that should be locating in the Region.

2. Industrial district located near housing

The proximity of housing to industry can sometimes pose certain threats to public health if an industrial firm is a major generator of air pollution. This problem appears to be the greatest in the urban core of the Region where some older manufacturing operations still generate substantial amounts of air pollution near to high density housing developments. Unfortunately, these areas are largely out of the immediate control of zoning since they generally antedated the adoption of local zoning ordinances. Nevertheless, industries which are creating air quality problems could be controlled in the long run by zoning amendments that would make these facilities non-conforming uses. Establishing non-conforming use regulations for industry is particularly important in urban areas where a large fraction of all manufacturing employment is in firms of 5 employees or less. These firms may not pose any immediate air pollution problems but could very well become threats to the public health if they expand their facilities within established high density residential developments. One clear example of this problem can be found in Waterbury where high density neighborhoods adjoin large manufacturing facilities such as Century Brass or Anaconda Copper. The significance of these land use conflicts will probably become more pronounced if and when commercial and industrial firms begin using cheaper but more polluting fuels like coal, coke and lignite for space heating and process use purposes. These future air pollution threats can be minimized by making certain types of hazardous industrial uses, located in residential districts, non-conforming uses. This approach protects the integrity of residential zoning by encouraging incompatible industrial development to grow in other more suitably zoned areas.

3. Cumulative zoning of Industrial Districts

While industry may sometimes be located in residential zones, residential development is quite commonly located in industrial zones. Once again the effect of this policy is the creation of land use conflicts which indirectly bear upon issues of public health. In the Central Naugatuck Valley Region eight out of twelve municipalities have adopted zoning regulations which permit non-industrial land uses in industrial zones (see Table 2). This form of zoning is called cumulative zoning since the broadest number of uses of the land are to be found in the least restricted zones - in this case industrial districts. Cumulative zoning operates much like a pyramid with residential zones at the top of the pyramid, followed by commercial zones in the middle (which allow both commercial and residential uses) and industrial zones at the bottom (which typically allow all uses - residential, commercial and industrial). The disadvantages of the cumulative zoning approach is that incompatible land uses can not be separated. Under cumulative zoning, one may very well find heavy industry located next door to low density single family developments or professional offices. Despite its obvious disadvantages the tendency has been to establish cumulative zoning in suburban municipalities since it avoids the issue of confiscation of private property rights when large land areas are zoned for industry and when these areas experience slow industrial development. In contrast, the more developed municipalities in the urban core of the Region, (Naugatuck, Waterbury, Watertown and Wolcott) have adopted non-cumulative zoning ordinances that prohibit residential uses in industrial zones. Non-cumulative zoning is also the adopted policy of towns which have municipally owned industrial parks (Naugatuck, Oxford and Waterbury). One clear advantage of municipal ownership of industrial land is stricter land use controls can be applied that ensure greater sensitivity is given to environmental issues.

Undeveloped municipalities like Oxford, Beacon Falls, Middlebury and Southbury still have the opportunity of reducing or eliminating incompatible land uses in their industrial zones simply by adopting some form of non-cumulative zoning strategy today. If a non-cumulative zoning strategy is adopted for municipally owned property or for smaller parcels of industrially zoned land, the suburban municipalities may be able to avoid many of the land use conflicts that have commonly emerged in the urbanized portion of the Region.

4. Separation of Residential and Industrial Developments

Just as proximity between incompatible land uses can lead to potential problems with public health safety and general welfare, so can excessive distance between incompatible land uses generate a similar set of problems. Over the last twenty years the place of residence and the place of work have gradually become farther and farther apart. Thirty years ago most people walked or took the bus to work. Today, land use patterns and public tastes have changed to such a degree that many now drive at least 10 miles one way to get to work. This dramatic shift in travel patterns has directly affected ambient air quality in the Region. More cars on the roads driving longer distances to get to work have increased the level of automobile related (mobile) sources of air pollution. It may take several significant land use reforms before anyone in this Region can perceive any change in the level of mobile source generated air pollutants. According to a study issued by the Regional Plan Association entitled, Urban Densities for Public Transportation, what is needed are major land use reforms that minimize travel times and encourage the utilization of mass transit. This can only be done slowly and incrementally by encouraging transit supporting densities along major highways capable of sustaining viable public bus service and by encouraging mixed use developments which reduce automobile travel for shopping and the journey to work.

There are numerous highways within the Central Naugatuck Valley which may have the potential of sustaining a viable public transportation system. In particular Route 63 in Middlebury, Route 69 in Wolcott and Route 69 to Prospect could each become important public transportation corridors if local zoning commissions are willing to provide for higher density development at suitable locations along these highways. The provision of higher density development will create a demand for public bus service which in turn may attract industries to locate along these corridors in order to reduce the travel expenses of their employees. The indirect benefit of establishing transit supporting densities will be a reduced reliance on the automobile and a reduced level of mobile source emissions.

5. Failure to restrict the types of industrial energy sources

Public Act 78-314 gave Connecticut Planning and Zoning Commissions the right to consider energy issues in the land use planning process. In particular, this enabling legislation allows local land use commissions to encourage (1) energy efficient patterns of development, (2) energy conservation, and (3) the use of solar and other renewable energy resources. This act is of more than passing interest to those concerned with air quality issues since it provides a legal mechanism for controlling emissions through innovative local energy regulations. Under Public Act 78-314 a municipality could restrict or prohibit the use of non-renewable energy resources as the primary means for hot water heating or space heating purposes. Just as many towns require utilities such as sewer or water as a prerequisite to development, towns in the future could mandate the use of specific types of energy services or supplies as a prerequisite to development. This approach is already being practiced in San Diego, California, where all new residential dwelling units are required to have a solar domestic hot water system as the principal

means of heating hot water. The Town of Cheshire, Connecticut is also considering a similar solar energy requirement which would be applicable within a floating zone known as the Planned Solar Residential Development District. Another approach that could be exercised by a local zoning commission would be to control the types of fuels used by large manufacturers. The Town of Cheshire already has a regulation that prohibits industries which combust soft coal in their manufacturing process. This type of regulation could certainly be extended to encourage or require the use of renewable non-polluting sources of energy whenever they are found to be a cost effective application. Significantly, the CNVRPA has recently completed an analysis of the life cycle costs of solar energy for domestic hot water purposes, and conducted that it is a better investment than fuel oil or electricity but not as good an investment as natural gas. From an air quality perspective the recent increases in fuel oil and electricity are casting a favorable light upon the use of solar energy and natural gas - two energy sources which are considered to be minimal generators of air pollution.

From a broader perspective land use commissions can play a major role in reducing air pollution and energy consumption by exercising some of the prerogatives granted to them by P.A. 78-314. In particular, encouraging energy conservation and energy efficient patterns of development are two programs that have a substantial impact on air pollution. Requiring higher levels of insulation, better building design practices, and better site planning for energy efficiency are a few examples of land use strategies which impact the quality of our air. Certainly, efforts to conserve energy can help reduce the level of air pollution generated by industrial and commercial firms.

6. Locating industrial districts in areas with poor meteorological conditions for the dispersion of air pollution

Historically, sites chosen for manufacturing activities in the Region were primarily located in areas with accessibility to water for power and transportation and with accessibility to urban areas for markets and labor.

Factors affecting the location decision of industry have gradually changed over time reflecting changes in the modes and cost of transportation and other factors. One new location factor which may play a significant role in the future location of industry is meteorology. It appears likely that some of the air quality modeling procedures established by the Connecticut Department of Environmental Protection and United States Environmental Protection Agency may eventually discourage some industries from locating in areas of poor meteorological conditions. This could be an issue in the Central Naugatuck Valley Region.

The valley created by the Naugatuck River has been the site for many of the largest and oldest manufacturing firms in the Region. Concentration of manufacturing firms are found near the Naugatuck River in Beacon Falls, Naugatuck, and Waterbury. This area is subject to some unusual meteorological conditions due to the steep hills that rise up on either side of the river valley. For firms like Uniroyal Chemical or the Waterbury Commons (both located on the Naugatuck River), the valley meteorology may eventually create serious constraints to the expansion of their industrial activities. This is due to the fact that air pollutants emitted by Uniroyal or Waterbury Commons must be assessed for their impact upon elevated land areas immediately downwind and above the rising plume of emissions whereas firms on flatland face no comparable air quality constraints due to the more favorable dispersion on flatland.

In the future, it would be advisable to relocate industrial zones to areas with more favorable meteorology. At the very least, land use commissions along the valley corridor should consider revising their industrial zoning regulations to avoid the possibility of permitting industry groups which could be expected to create local air pollution problems upon elevated land areas adjacent to the river. The unfortunate consequence of these meteorological limitations is that the more heavily industrialized portions of the Region are in a less advantageous position with regard to air pollution dispersion. Consequently, efforts must be made to balance the air quality advantages of suburban industrial parks with the economic development advantages available in the Region's Urban Core.

7. Prohibition of firms known to be generators of toxic or hazardous air pollution

Four of the Region's municipalities (Cheshire, Prospect, Southbury and Thomaston) have specifically developed a comprehensive list of industry groups or commercial firms which are clearly prohibited from locating in their town. Some of the major industries which are prohibited in Cheshire, Prospect, Southbury and Thomaston include firms manufacturing ammonia, chlorine, creosote, glue, gelatine, hydrochloric acid, nitric acid, animal fats, soaps from animal fats, petrochemicals, grain drying and the slaughter or reduction of dead animals. In addition three municipalities (Oxford, Waterbury and Woodbury) have developed a partial list of industries prohibited from locating in these communities. The remaining five municipalities of the Region do not prohibit specific industry groups but could very well have the discretion to prohibit firms generating hazardous or toxic pollutants through the use of performance standards for smoke, fly ash and dust or through the performance standards for odors, gases and fumes. While performance standards

do provide some degree of control their disadvantage is that they tend to be rather general and may be very difficult to enforce by an untrained zoning enforcement officer even with the adoption of specific quantitative criteria and standards. Table 1 indicates the types of manufacturing and commercial firms which are prohibited from locating in the Central Naugatuck Valley Region. Presumably, the five municipalities which have no prohibitions against industry could also exercise a similar degree of control through the use of performance standards for air pollution. However, in practice, this may not be the case. The general vagueness of the performance standards adopted by all the Region's municipalities may make this an unlikely tool for environmental control and an even less likely tool for prohibiting known generators of toxic and hazardous pollutants.

Table 1:

PROHIBITED COMMERCIAL AND MANUFACTURING USES
IN THE CENTRAL NAUGATUCK REGION: 1980

(d = prohibited)

Prohibited Uses	Beacon Falls	Pethlehem	Cheshire	Middlebury	Naugatuck	Oxford ¹	Prospect	Southbury	Thomaston	Waterbury	Watertown	Volcott	Woodbury
Amonia Manufacture			o				o	o	o				
Chlorine Manufacture			o				o	o	o				
Bleaching Powder			o					o					
Blast Furnaces			o					o					
Drop Hammers			o										
Creosote Treatment			o				o	o	o				
Petrochemical Manufacture			o				o	o	o				
Distillation of wood, coal, petroleum			o				o	o	o				
Glue/size/gelatine manufacture			o				o	o	o	o			
Grain drying			o				o	o	o				
Commercial incineration			o					o					
Slaughter or reduction of dead animals			o			o	o	o	o	o			o
Rawhides or skin storage			o					o					o
Tanning or curing			o										
Soap Manufacture from animal fats			o				o	o	o	o			
Sulphurous acid manufacture			o				o	o	o				
Nitric acid			o				o	o	o				
Carbolic acid			o				o	o	o				
Hydrochloric acid			o				o	o	o				
Explosives manufacture						o	o	o	o	o			
Sand & gravel processing plants						o							
Crematories						o		o					
Phosphoric acid							o		o				
Puric acid			o				o		o				
Plastic materials & synthetic resins							o		o				
Industrial alcohol							o		o				
Caustic Soda							o		o				
Aniline dyes							o		o				
Carbon black							o		o	o			
Cellulose							o		o				
Rayon yarn							o		o				
Nitrating Cotton							o		o				
Asphalt production							o		o				
Charcoal & fuel briquetting							o		o				
Industrial process utilizing combustion of soft coal			o										
Potash							o		o				
Pyroxillin							o		o				
Fertilizer Manufacture							o			o			
Rubber, natural & synthetic							o						
Paper mill operations							o						
Fur manufacture								o					
Sawmills & planing mills										o			

¹ Broad prohibition on dangerous manufacturing activities.Source: CNVRPA staff work based on the zoning regulations of each municipality,
September 1980

Table 2: Regulations Concerning Air Quality in the Zoning Ordinances of Municipalities in the Central Naugatuck Valley Region: 1980

Municipality	Non-Cumulative Zoning	Coverage of Performance Standards	Performance Standards for Dust, Dirt, Fly Ash, Smoke	Performance Standards for Odors, Gases, Fumes	General Prohibition of Specific Commercial and Industrial Uses
Beacon Falls	No	All uses	Yes	Yes	No ²
Bethlehem	-----No Zoning Regulations-----				
Cheshire	No	All uses	Yes	Yes	Yes
Middlebury	No	All uses	Yes	Yes	No
Naugatuck	Yes	All uses	Yes	Yes	No
Oxford	No	All uses	Yes	Yes	Yes ²
Prospect	No	All uses	Yes ¹	No ¹	Yes
Southbury	No	Non-residential	Yes	Yes	Yes
Thomaston	No	Non-residential	Yes	Yes	Yes
Waterbury	Yes	Commercial & Industrial	Yes	Yes	Yes
Watertown	Yes	All uses	Yes	Yes	No
Wolcott	Yes	Industrial	Yes	Yes	No
Woodbury	No	Non residential	Yes	Yes	Yes

¹Performance Standards are based on DEP regulations for abatement of air pollution.

²Dangerous manufacturing processes excluded.

SOURCE: CNVRPA Staff work bases on the zoning regulations in each municipality, September 1980.

Table 3:

Permitted Uses Allowed in Industrial Zones of the Central Naugatuck Valley
Region which are of Possible Air Quality Concern

Municipality	Iron and Steel Foundries	Non- Ferrous Foundries	Metal Finishing	Heat Treating	Rubber & Misc. Products	Coal Yards	Dry Cleaning	Dyeing Plants	Removal of Earth Products
Beacon Falls									o
Bethlehem	-----No Zoning Regulations-----								
Cheshire							o	o	o
Middlebury			o				o	o	o
Naugatuck									o
Oxford			o	o			o		o
Prospect		o	o	o			o	o	o
Southbury							o	o	o
Thomaston						o	o	o	o
Waterbury	o	o	o	o	o		o	o	o
Watertown							o	o	o
Wolcott									o
Woodbury									*

SOURCE: CNVRPA staff work based on the Zoning regulations in each municipality September, 1980

* Removal of earth products requires a zone change to Earth Excavation District in Woodbury, consequently, a sand and gravel operations can not exist within an industrial zone.

Footnotes:

- ¹The maximum lot coverage only applies to the building.
- ²Building height can be increased to 65 feet if setback requirements are increased.
- ³In Oxford buffer zones can not be used in calculating lot coverage.
- ⁴The standard for parking spaces per employee is based on a single shift firm.
- ⁵In addition, Prospect limits the maximum ground coverage of buildings, parking lots, loading area, etc. to 70 percent of the lot.
- ⁶Thomaston, Waterbury and Woodbury also provide for an alternative approach for determining minimum parking space requirements based on the floor area of the firm. The standards are as follows:
 - a. Thomaston 1 space/750 square feet of floor area
 - b. Waterbury 1 space/500 square feet of floor area
 - c. Woodbury 1 space/400 square feet of floor area
- ⁷Loading space requirements are determined by variable standards after 15,000 square feet. The standards are as follows:

<u>Floor Area</u>	<u>Parking Space</u>
15,000 to 25,000	1 space
25,000 to 50,000	2 spaces
50,000 to 75,000	3 spaces
75,000 to 100,000	4 spaces

Over 100,000: add 1 space per 50,000 square feet

B. Air Quality Impact of Zoning Standards for Industrial Development

1. Parking space requirements

Zoning ordinances governing industrial development typically include standards for the minimum number of parking spaces a new firm must construct in order to meet zoning requirements. In the Central Naugatuck Valley Region parking space requirements are controlled through standards governing the minimum parking spaces per employee on the largest shift operated by a firm. This regulation may have an indirect impact on air quality by implicitly encouraging the use of single occupancy vehicles for the journey to work or conversely by discouraging the use of mass transit services to the industrial facility. In the Central Naugatuck Valley Region standards for the minimum number of parking spaces per employee on the largest shift range from .33 spaces per employee in Thomaston to 2.0 spaces per employee in Wolcott. By requiring a large number of parking spaces per employee a local zoning commission may be inadvertently sanctioning the use of single occupancy vehicles for the journey to work. If zoning ordinances adopted nominal parking space requirements per employee (as has been done in Thomaston) there would be greater incentives to carpool or use public transportation when and where available. The long term effect of this policy when coupled with land use policies aimed at generating transit supporting densities (see Section A) could be to reduce the level of air pollutants emitted by vehicles used for the journey to work trip.

2. Building height limitations

Energy conservation is intimately related to air quality in the colder climates of the United States. Buildings which are well designed will reduce winter fuel consumption for space heating and in turn reduce the emissions generated by the combustion of space heating fuels. One means of reducing energy

consumption and air pollution emissions is through the development of building designs which make optimum use of common walls and the insulation capabilities of underground construction and minimize the exposed surface area of the building.

Building height regulations for industrial development directly affect energy conservation and air quality. Assuming equal floor areas, climate and building insulation, a two story building will be more energy efficient than a one story building.

For example, a one story building with 40,000 square feet of floor space will have 46,400 square feet of exposed wall and roof area (assuming 8 foot walls). Whereas a two story building with 40,000 square feet of floor space will have only 29,050 square feet of exposed wall and roof area. The amount of exposed surface area is directly related to local zoning standards which limit the maximum height of an industrial structure. Municipalities which prohibit the construction of two, three or four story buildings or which prohibit buildings from exceeding a height of 30 feet are directly limiting the energy design options available to an industrial developer.

Certainly height restrictions do make sense. However these restrictions should be related to setback requirements so that adjoining neighbors will be assured that a new structure will not block their access to light and that the developer can be assured of developing the most energy efficient design possible. The indirect benefit of relating height restrictions to setback standards will be to reduce air pollution generated by winter space heating requirements.

3. Maximum floor area ratio

Just as building height limitations can discourage the construction of taller more energy efficient buildings, maximum floor area ratio regulations can discourage the vertical configuration of industrial floor space. In the Central Naugatuck Valley Region maximum floor area ratios have been adopted by six municipalities (Middlebury, Naugatuck, Oxford, Southbury, Thomaston and Watertown). Maximum floor area ratios range from 30 percent in Middlebury's L 1-80 industrial district to 200% in Naugstuck's L-1 industrial district. Restricting the ratio of floor area to lot area tends to discourage the vertical configuration of space in a manner similar to that accomplished by excessively low building height limitations. As long as a zoning ordinance contains provisions regulating the maximum ground coverage of a lot by an industrial structure there is no reason why floor area ratios could not be made more flexible to allow for more intensive use of land. Once again the net benefit of allowing a higher ratio of floor space to lot area will be a reduction in energy consumption and air pollutant emissions.

4. Setback requirements

Setback requirements generally reflect a concern for providing adequate light ventilation and air. The disadvantage of setback requirements is that they often prove to be too inflexible in cases where innovative development proposals are being considered. In particular, setback requirements do not allow for the opportunity of using the zero lot line concept in condominium industrial parks or in other multi ownership or multi occupant structures. The advantage of the zero lot line concept is that it allows for industrial developers to build a series of buildings sharing common walls and sometimes common roofs. Common wall construction is a recognized approach in energy efficient industrial developments. Common walls reduce energy consumption and consequently improve the air quality.

In the Central Naugatuck Valley Region none of the zoning regulations provide an opportunity for zero lot line industrial developments. Ironically, this was one of the most common forms of development in the earlier days of Waterbury where many small industries shared space in one large building. A recent example of a viable multi occupant industrial structure is the current renovation of the Chase Brass factory into the condominium industrial facility known as Waterbury Commons. This innovative rehabilitation project is clearly an example of a building utilization scheme that has value for future economic development efforts and which should be supported, if not promoted, by local zoning ordinances.

5. Floor area requirements

Two municipalities in the Region stipulate the minimum number of square feet of floor area that any new industrial firm must have in order to locate in town. These municipalities are Prospect and Woodbury which respectively require a minimum of 5,000 and 2,000 square feet of floor space in all new industrial firms. The direct impact of a minimum floor area standard is the creation of buildings which may be excessively large for new firms seeking small facilities in which to initiate production at the lowest possible costs for overhead and energy. For example a new firm seeking a suburban location with a maximum of 2,000 square feet of floor space would still be required to construct 3,000 additional square feet of plant space in Prospect simply to meet the local requirement that every new industrial firm have a minimum of 5,000 square feet of floor area. This standard directly relates to energy conservation and air quality; the more square feet of floor space required the greater the fuel consumption; and the greater the fuel consumption (particularly of fossil fuels) the greater the air pollution emissions.

Basic Zoning Requirements Governing Industrial Development in the
Central Naugatuck Valley Region: 1980

Municipality	Zoning District	Maximum Floor Area Ratio (%)	Maximum Ground Coverage (%)	Maximum Height Structure	Minimum Frontage Requirement	Minimum Setback from Street	Minimum Setback from Residential	Minimum Lot Size (square ft.)	Floor Area Requirement (square ft.)	Minimum Number of Parking Space per Employee on Largest Shift
Beacon Falls	I	None	30	30	25	25	50	85,000	None	0.66
Bethlehem	----- No Zoning Regulations -----									
Cheshire	I-1	None	25	50	60	50	50	40,000	None	0.66
	I-2	None	25	50	60	100	50	80,000	None	0.66
Middlebury	LI-80	30	25	35	200	100	N.S.	80,000	None	0.66
Naugatuck	I-1	200	50	40	50	25	25	20,000	None	0.66
	I-2	100	40	40	50	50	50	40,000	None	0.66
Oxford	I	None	20	35	175	50	100	65,340	None	1.50
	IP	None	20	35	300	100	100	217,800	None	1.50
Prospect	IND	None	25	35	150	50 ¹	100	40,000	5,000	0.50
Southbury	M1	90	25	40	50	50 ¹	50	87,120	None	1.00 ²
	M2A	30	15	40	50	50 ¹	100	87,120	None	1.00 ²
	M5	30	15	40	50	50	100	217,800	None	1.00 ²
Thomaston	M	100	None	50	100	None	None	None	None	0.33 ³
Waterbury	IG	None	50	80	100	15	None	20,000	None	1.00 ²
	IP	None	40	60	150	25	None	40,000	None	1.00 ²
Watertown	IG-80	120	40	60	50	50	50	80,000	None	0.66
	IG-200	120	40	60	50	50	100	200,000	None	0.66
	IR-80	60	30	60	50	50	75	80,000	None	0.66
	IR-200	50	25	60	50	50	100	200,000	None	0.66
Wolcott	I	None	None	30	200	None	None	43,560	None	2.00 ⁴
Woodbury	PID	None	25	30	100	N.S.	N.S.	217,800	2,000	1.00

N.S. = Not Specified

¹Setback is greater on State Highway.

²Or 500 square feet, whichever is greater

³Or 750 square feet, whichever is greater.

⁴Applies to any one shift.

Source: CNVRPA staff work, August 1980.

Conclusion

Land use regulations do influence air quality and can play an important long term role in protecting the public health and safety. However, the zoning regulations in the Central Naugatuck Valley Region have not always been created with air quality protection in mind. Consequently, many regulations still allow industries which are known generators of hazardous air pollutants and many regulations place too few restrictions upon the proper location of industrial zones vis a vis residential districts and meteorologically poor areas of the community. In the future, communities must consider the air quality impact of their land development patterns so as to avoid mixing incompatible land uses. Zoning can be a strong tool for protecting air quality especially with the new authority granted to zoning commissions enabling them to address energy issues in the land development process. As more polluting fuels such as wood and coal become more widely used, it is expected that air quality protection will become a more serious issue in the Waterbury area. Increased emissions from traditionally nonregulated sources of air pollution such as fuels burned for home heating may make land use controls one of the significant tools for protecting future air quality. For example, local requirements for the use of solar energy and energy conservation could become significant air quality strategies as wood and coal begin displacing fuel oil and natural gas as the principal means of residential space heating. Faced with an industrial sector that has done about as much as it will ever be able to do to reduce emissions through stack controls, it appears that land use controls offer some significant air quality benefits.